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Walther

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(54) **METHOD AND APPARATUS FOR
CONTROLLING ION IMPLANTATION
DURING VACUUM FLUCTUATION**

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(52) **U.S. Cl.** **250/492.21; 250/492.1**

(58) **Field of Search** **118/723; 438/14,
438/15; 116/208; 250/492.21; 364/550;
156/345**

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(57) **ABSTRACT**

A method and apparatus for controlling implantation during vacuum fluctuations along a beam line. Vacuum fluctuations may be detected based on a detected beam current and/or may be compensated for without measuring pressure in an implantation chamber. A reference level for an ion beam current can be determined and a difference between the reference value and the measured ion beam current can be used to control parameters of the ion implantation process, such as a wafer scan rate. The difference value can also be scaled to account for two types of charge exchanging collisions that result in a decrease in detected beam current. A first type of collision, a non-line of sight collision, causes a decrease in detected beam current, and also a decrease in the total dose delivered to a semiconductor wafer. A second type of collision, a line of sight collision, causes a decrease in detected beam current, but does not affect a total dose delivered to the wafer. Scaling of the difference can therefore be used to adjust a wafer scan rate that accounts for non-line of sight collisions.

15 Claims, 4 Drawing Sheets

